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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/423,436 11/09/99 KANAYAMA

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EXAMINER

LAVILLA, M

ART UNIT

PAPER NUMBER

1775

DATE MAILED:

07/31/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trad marks**

# Office Action Summary

Application No.

09/423,436

Applicant(s)

KANAYAMA ET AL.

Examiner

LAVILLA

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some\* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3 20) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Specification*

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

### *Claim Objections*

2. Claims 3 and 8 are objected to because of the following informalities: At line 3 of Claim 3 and analogously in Claim 8, it appears that the claim should read, "in the sliding direction." Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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I. Regarding Claim 1, in view of the preamble of independent Claim 1 and those of the dependent claims, it is unclear whether applicant is claiming an internal combustion engine or a sliding bearing. It is unclear whether the phrases “essential elements” and “balance essentially consisting of” invoke either or both of the standard phrases “consisting of” and “consisting essentially of” in describing the composition of the sliding layer or whether they are equivalent to “comprising” language. It is unclear whether the phrase “as essential elements” refers to Ag and Sn or to Ag, Sn, and Cu. In line 11 of Claim 1, it is unclear what is the antecedent basis of the phrase “the sliding surface.” In line 12 of Claim 1, it is unclear what is the antecedent basis of the phrase “these elements.” Does this refer to Ag and Sn or to Ag, Sn, and Cu or to some other elements? In line 14 of Claim 1, it is unclear what is the antecedent basis of the phrase “these elements.” In lines 14 and 15 of Claim 1, it is unclear what is meant by the phrase “eutectic of Ag and Sn or Cu and these elements.” What elements may constitute the eutectic composition? In line 16 of Claim 1, it is unclear what is the antecedent basis of the phrase “sliding layer.” Is this a reference to the resin layer? Could this refer to a region in the vicinity of the sliding surface? Is the region in the vicinity of the sliding surface necessarily farther from the resin layer than the location of sublayer of a portion of the sliding layer? What layer or layers is the sublayer under? Does the limitation pertaining to “direct contact” necessarily imply that the “portion of the sliding layer” refers the resin layer outer surface? It is unclear with respect to what baseline measure a layer is to be “concentrated.”

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II. Regarding Claims 2-10, it is unclear what is being claimed as Claim 1 purportedly claims an internal combustion engine, whereas the dependent claims refer to a sliding bearing for an internal combustion engine. It appears that the word "contains" in line 2 should be replaced with the phrase "further comprises." It is unclear what is the antecedent basis of the phrase "sliding surface." It is unclear what is the antecedent basis of the phrases "these elements" and "these elements with one another." It is unclear what is meant by the phrase "a eutectic of said essential elements and additive elements or Cu and these elements." It is unclear what is meant by the phrase "sliding layer." Is this a reference to the resin layer? Could this refer to a region in the vicinity of the sliding surface? Is the region in the vicinity of the sliding surface necessarily farther than the resin layer than the location of sublayer of a portion of the sliding layer? What layer or layers is the sublayer under? Does the limitation pertaining to "direct contact" necessarily imply that the "portion of the sliding layer" refers the resin layer outer surface? It is unclear with respect to what baseline measure a layer is to be "concentrated." When additive elements are present, it is unclear whether the solid-dissolved material lacking secondary phase in the vicinity of the sliding surface and the concentrated layer or other sublayer possibilities of at least a portion of the sliding layer are independent of those described in Claim 1. For example, is applicant claiming that both kinds of eutectics are to be present?

III. Regarding Claims 3 and 8, it is unclear whether what is claimed is that the roughened surface is formed by forming grooves or that the roughened surface comprises a groove structure. The

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specification describes making grooves and then shot blasting, for example, the grooved surface until the claimed Rz values are achieved. Were applicant to amend the claim to read "formed of grooves," the indefiniteness would be obviated.

IV. Regarding Claim 7, it is unclear what is the antecedent basis of the phrase "said coating layer." Is this the resin coating?

*Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 4, 6, and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Ohshiro et al. USP 6,025,081. Ohshiro et al. teaches sliding bearings for internal combustion engines comprised of metal backing layers coated with copper alloy materials of the claimed compositions. The copper alloy materials possess surface roughness measures of 0.5 microns and are further coated with resin layers having MoS<sub>2</sub> (see Abstract; Figure 5; col. 2, lines 17-57; col.

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3, lines 8-12, 33-51; col. 3, line 60 through col. 4, line 18; col. 4, lines 36-48 and 59-62; col. 5, lines 49-61; col. 6, lines 6-10; Table 1; Example 3; and Table 3 -- Exs. 30-33 in Ohshiro).

Ohshiro describes the initial copper bearing composition to be solid-dissolved and forming concentrated layer upon usage as applicant claims. The amount of MoS<sub>2</sub> is described in the corresponding WO 97/15695 as 50 vol. %. Due to the significantly greater density of MoS<sub>2</sub> as compared to the resin materials, the claimed weight percentage of MoS<sub>2</sub> should be inherently achieved. Although Ohshiro does not disclose shot blasting the surface of the bearing layer, Ohshiro does teach that shot blasting may be effective for improving adherence to the overlay. Nevertheless, the claimed surface roughness of 0.5 microns is satisfied due to the disclosure of Ohshiro that the materials of Ohshiro possess this surface roughness, regardless of how the surface roughness was achieved. In view of the thickness of the overlay the claimed size of the MoS<sub>2</sub> particles would be expected to be inherently achieved. Silver sulfide compounds are described as forming at the resin/sliding layer interface; these compounds may be considered part of the resin layer and may be considered to serve as lubricant materials.

7. Claims 1, 4, 6, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohshiro et al. WO97/15695. Ohshiro et al. teaches sliding bearings for internal combustion engines comprised of metal backing layers coated with copper alloy materials of the claimed compositions. The copper alloy materials possess surface roughness measures of 0.5 microns and are further coated with resin layers having MoS<sub>2</sub> (see Abstract; Figure 5; col. 2, lines 17-57; col.

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3, lines 8-12, 33-51; col. 3, line 60 through col. 4, line 18; col. 4, lines 36-48 and 59-62; col. 5, lines 49-61; col. 6, lines 6-10; Table 1; Example 3; and Table 3 -- Exs. 30-33 in Ohshiro USP 6,025,081 which corresponds to this PCT application). Ohshiro describes the initial copper bearing composition to be solid-dissolved and forming concentrated layer upon usage as applicant claims. The amount of MoS<sub>2</sub> is described as 50 vol. %. Due to the significantly greater density of MoS<sub>2</sub> as compared to the resin materials, the claimed weight percentage of MoS<sub>2</sub> should be inherently achieved. Although Ohshiro does not disclose shot blasting the surface of the bearing layer, Ohshiro does teach that shot blasting may be effective for improving adherence to the overlay. Nevertheless, the claimed surface roughness of 0.5 microns is satisfied due to the disclosure of Ohshiro that the materials of Ohshiro possess this surface roughness, regardless of how the surface roughness was achieved. In view of the claimed thickness of the overlay, the claimed particle size of MoS<sub>2</sub> would be expected to be inherently achieved. Silver sulfide compounds are described as forming at the resin/sliding layer interface; these compounds may be considered part of the resin layer and may be considered to serve as lubricant materials.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person



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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshiro et al. USP 6,025,081 in view of Oshiro EP795693. Ohshiro et al. teaches sliding bearings for internal combustion engines comprised of metal backing layers coated with copper alloy materials of the claimed compositions. The copper alloy materials possess surface roughness measures of 0.5 microns and are further coated with resin layers having MoS<sub>2</sub> (see Abstract; Figure 5; col. 2, lines 17-57; col. 3, lines 8-12, 33-51; col. 3, line 60 through col. 4, line 18; col. 4, lines 36-48 and 59-62; col. 5, lines 49-61; col. 6, lines 6-10; Table 1; Example 3; and Table 3 -- Exs. 30-33 in Ohshiro). Ohshiro describes the initial copper bearing composition to be solid-dissolved and forming concentrated layer upon usage as applicant claims. The amount of MoS<sub>2</sub> is described in the corresponding WO 97/15695 as 50 vol. %. Due to the significantly greater density of MoS<sub>2</sub> as compared to the resin materials, the claimed weight percentage of MoS<sub>2</sub> should be inherently achieved. Although Ohshiro does not disclose shot blasting the surface of the bearing layer, Ohshiro does teach that shot blasting may be effective for improving adherence to the overlay. Nevertheless, the claimed surface roughness of 0.5 microns is satisfied due to the disclosure of Ohshiro that the materials of Ohshiro possess this surface roughness, regardless of how the surface roughness was achieved. Ohshiro does not teach using copper alloys having the claimed additive elements. Ohshiro teaches adding the claimed additive elements to Cu/Ag/Sn alloy bearing layers in order to take advantage of their propensity to improve wear resistance (see page 6, lines 29-33; page 7, lines 6-40; and Example 3 -- Nos. 39-51 in Ohshiro). It would have been obvious

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to one of ordinary skill in the art at the time of the invention to utilize the copper alloys of Ohshiro in the laminates of Ohshiro in order to take advantage of the favorable wear resistance properties of the alloys of Ohshiro.

10. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshiro et al. WO97/15695 in view of Ohshiro EP 795693. Ohshiro et al. teaches sliding bearings for internal combustion engines comprised of metal backing layers coated with copper alloy materials of the claimed compositions. The copper alloy materials possess surface roughness measures of 0.5 microns and are further coated with resin layers having MoS<sub>2</sub> (see Abstract; Figure 5; col. 2, lines 17-57; col. 3, lines 8-12, 33-51; col. 3, line 60 through col. 4, line 18; col. 4, lines 36-48 and 59-62; col. 5, lines 49-61; col. 6, lines 6-10; Table 1; Example 3; and Table 3 -- Exs. 30-33 in Ohshiro USP 6,025,081 which corresponds to this PCT application). Ohshiro describes the initial copper bearing composition to be solid-dissolved and forming concentrated layer upon usage as applicant claims. The amount of MoS<sub>2</sub> is described as 50 vol. %. Due to the significantly greater density of MoS<sub>2</sub> as compared to the resin materials, the claimed weight percentage of MoS<sub>2</sub> should be inherently achieved. Although Ohshiro does not disclose shot blasting the surface of the bearing layer, Ohshiro does teach that shot blasting may be effective for improving adherence to the overlay. Nevertheless, the claimed surface roughness of 0.5 microns is satisfied due to the disclosure of Ohshiro that the materials of Ohshiro possess this surface roughness, regardless of how the surface roughness was achieved. Ohshiro does not teach using copper alloys having the

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claimed additive elements. Oshiro teaches adding the claimed additive elements to Cu/Ag/Sn alloy bearing layers in order to take advantage of their propensity to improve wear resistance (see page 6, lines 29-33; page 7, lines 6-40; and Example 3 -- Nos. 39-51 in Oshiro). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the copper alloys of Oshiro in the laminates of Ohshiro in order to take advantage of the favorable wear resistance properties of the alloys of Oshiro. Ohshiro also does not teach adding further solid lubricants or friction adjusting agents to the overlay.

11. The subject matter of those claims not rejected over prior art references was not considered to be anticipated or rendered obvious by the reviewed prior art. Bearings having the claimed qualities and having grooves extending in the sliding direction were not disclosed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael LaVilla whose telephone number is (703) 308-4428. Facsimile communications may be sent to (703) 305-5408.

Michael LaVilla

July 25, 2001